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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,577	03/01/2004	Sunil G. Warriar	02-506	9868
34704	7590	07/21/2006		
BACHMAN & LAPOINTE, P.C. 900 CHAPEL STREET SUITE 1201 NEW HAVEN, CT 06510				
			EXAMINER ONEILL, KARIE AMBER	
			ART UNIT 1745	PAPER NUMBER

DATE MAILED: 07/21/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/790,577

Applicant(s)

WARRIER ET AL.

Examiner

Karie O'Neill

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 01 March 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-16 and 28 is/are rejected.
- 7) ☒ Claim(s) 17-27 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 March 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3-7, 11 and 14-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Hartvigsen et al. (US 6,224,993 B1).

With regard to Claim 1, Hartvigsen et al. discloses in Figures 1 and 2, an electrolyte assembly for solid oxide fuel cells, comprising: an electrolyte member (201) defining a cathode side and an anode side and having an active area and an edge portion (column 3 lines 25-28); a cathode disposed on said cathode side; and anode disposed on said anode side (column 1 lines 46-54); and at least one electrolyte support member (200) positioned adjacent to said edge portion of said electrolyte and having an opening (230, 231, 232) positioned over said active area.

With regard to Claims 2, 5 and 6, Hartvigsen et al. discloses in Figure 1 and column 4 lines 44-53, the electrolyte support members (200, 202) are supported by electrodes (not shown) on either side and can be applied to an already sintered electrolyte, or co-fired together with the electrolyte.

With regard to Claim 3, Hartvigsen et al. discloses wherein at least one electrolyte support member comprises an electrolyte material (column 3 lines 29-31).

With regard to Claim 4, Hartvigsen et al. discloses in column 3 lines 48-52, each of the support members comprise a material substantially identical to or substantially compatible with the electrolyte plate. Therefore, the support material and the electrolyte material have substantially the same CTE.

With regard to Claim 7, Hartvigsen et al. discloses the electrolyte having a thickness of 180 $\mu$ m at its thickest and 30 $\mu$ m at its thinnest (column 4 lines 57-59).

With regard to Claims 11 and 16, Hartvigsen et al. discloses in Figures 1-3, wherein at least one support member (12) is in the shape of strip-like ribs and has sides extending along said edge portion (24), and wherein said ribs extend between opposite side members. In column 4 lines 34-40, Hartvigsen et al. discloses, the support providing means comprising support members being laminated to the electrolyte plate and extending to the outer peripheral regions of the electrolyte plate. As can be seen in Figures 1 and 2, the support plates are provided as a grid wherein ribs extend between side members of the support plate.

With regard to Claims 14 and 15, Hartvigsen et al. discloses wherein said ribs and electrolyte support member comprise electrolyte material, because the ribs are part of the support members and each of the upper and lower support members comprise material substantially identical to the electrolyte (column 3 lines 48-50), which would then essentially make the support material and the electrolyte material to have substantially the same CTE.

With regard to Claim 28, Hartvigsen et al. discloses wherein the electrolyte member (11) is made of yttria stabilized zirconia (column 3 line 51) and wherein said grid or support plates (14, 16) define a plurality of openings (230, 231, 232) between said ribs (Figures 1 and 2), and electrolyte elements are positioned in said openings because the support plates and electrolyte member are formed as part of a unitary, integral structure (column 3 lines 44-46) and are made of the same materials.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 8, 10, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hartvigsen et al. (US 6,224,993 B1), as applied to Claims 1, 3-7, 11 and 14-16 above, and in further view of Badding et al. (US 2004/0028975 A1).

Hartvigsen et al. discloses the electrode assembly in paragraph 2 above, but does not disclose wherein the electrolyte has a thickness of less than or equal to about 20µm, the electrolyte further including via lines for communicating said anode and said cathode through said electrolyte, and wherein said at least one electrolyte support member includes ribs extending along said via lines, wherein said ribs are laminated to said via lines and wherein said ribs are bonded to said via lines.

With regard to Claim 8, Badding et al. discloses the electrolyte sheet being about 20 microns thick (paragraph 0023). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use the electrolyte with such a thickness in the assembly of Hartvigsen et al., because Badding et al. teaches that the smaller thickness creates a better hermetic seal at lower processing temperatures.

With regard to Claim 10, Badding et al. discloses in Figures 1a and 1b, the electrolyte (108) including via holes (114) for communicating said anode (110) and said cathode (112) through electrolyte (paragraph 0019), and wherein said at least one electrolyte support (104) includes ribs extending along via lines. Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use via holes in accordance with the Hartvigsen et al. assembly, because the Badding et al. reference teaches that the electrodes do not form continuous layers on the electrolyte sheet, but instead define discrete regions or electrochemical cells which are then connected in series, parallel or a combination thereof by one or more electrical conductors.

With regard to Claims 12 and 13, Badding et al. discloses in paragraph 0023, the electrolyte sheet (108) and via holes (114) being sintered to form electrical conductors (104) and the electrical conductor (104') being bonded to the electrolyte sheet (108) in paragraph 0021). Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to sinter or bond the ribs of the support member to the via holes of the assembly of Hartvigsen et al., in order to reduce the stress put on the support member and electrolyte at room temperature.

5. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hartvigsen et al. (US 6,224,993 B1), as applied to Claims 1, 3-7, 11 and 14-16 above and in further view of Khandkar et al. (US 5,856,035).

Hartvigsen et al. discloses the electrode assembly in paragraph 2 above, but does not disclose the assembly further comprising bus bars disposed on said electrolyte defining a bus bar zone, and wherein said at least one electrolyte support member extends over said bus bar zone.

Khandkar et al. discloses in column 5 lines 35-49, bus bars collecting current from several cells or plates. Therefore, at the time of the invention it would have been obvious to one of ordinary skill in the art to use bus bars disposed on the electrolyte assembly of Hartvigsen et al., because the extension of the bus bars into an oxidizing or reducing atmosphere will not affect the current collection of the bus bars because the cores of the bars will be protected and remain conductive.

#### ***Allowable Subject Matter***

6. Claims 17-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

7. The following is a statement of reasons for the indication of allowable subject matter: Claims 17-27 would be allowable because the closest prior art, Hartvigsen et al., does not teach or fairly suggest electrolyte support ribs being formed in a grid in

Art Unit: 1745

which ribs extend between side members in a first direction and a second group of ribs extend from side members in a second direction and define points of intersection, and wherein said grid of bonded to a cathode at points of intersection, bonded to an anode at points of intersection, bonded to a cathode at points other than points of intersection, bonded to an anode at points other than points of intersection, and wherein said grid is made of wire mesh, foam, ferritic stainless steel, zirconia foam, is made of a material with substantially the same CTE as the electrolyte and has an insulating coating.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Karie O'Neill whose telephone number is (571) 272-8614. The examiner can normally be reached on Monday through Friday from 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.




Art Unit: 1745

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Karie O'Neill  
Examiner  
Art Unit 1745

KAO



**DAI WEI YUAN**  
**PRIMARY EXAMINER**